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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,571	12/27/2005	Jens A Hansen	H0610.0400/P400	7882
24998 7590 05/28/2008 DICKSTEIN SHAPIRO LLP 1825 EYE STREET NW Washington, DC 20006-5403				
EXAMINER				
SINGH, PREM C				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/562,571

Applicant(s)

HANSEN ET AL.

Examiner

PREM C. SINGH

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03/27/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Amendment to claim 1 is noted.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (US Patent 5,350,501).

6. With respect to claim 1, Ward discloses a process for hydrocracking of hydrocarbon feedstock (See column 11, lines 10-26) into middle distillates (See column 8, lines 26-28) in the presence of hydrogen (See column 11, lines 29-30) by contacting the feedstock with a catalyst comprising a beta zeolite and a Y zeolite (See abstract) at a temperature of 232-454°C and a pressure of 51-238 atm (5.1-23.8 MPa) (See Table I, column 11), the Y zeolite having a unit cell size below about 24.45 Å (See abstract) and a molar SiO₂: Al₂O₃ ratio of 4.5 to 35 (See column 5, lines 47-49), the beta zeolite having a silica-alumina ratio of at least 10 to 500 or more (See column 4, lines 3-8). It is to be noted that the ranges of temperature and SiO₂: Al₂O₃ ratio for beta zeolite and Y zeolite disclosed by Ward overlap the claimed ranges. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. See *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); Also, see *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

It is to be noted that Ward invention does not specifically disclose middle distillates with aromatic compounds lower than the same fraction contained in the feedstock, however, the invention does disclose that the catalyst of the present process comprises Group VI B and Group VIII metals (See column 8, lines 45-50) and is useful in hydrogenation reactions (See column 7, line 47-52). It is also to be noted that hydrocracking is taking place in presence of hydrogen. Obviously, during hydrocracking of the hydrocarbon feedstock, hydrogenation of aromatics will also take place, causing bond saturation and thus reduction in the aromatic content of the middle distillates. Thus, it would have been obvious to one skilled in the art at the time the invention was made to specify that the middle distillates produced in the hydrocracking operation will have reduced aromatics as compared to the aromatic content in the feedstock.

7. With respect to claim 2, Ward discloses that Y zeolite has unit cell size preferably between 24.25 and 24.35 Å (See column 5, lines 66-67). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. See *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); Also, see *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

8. With respect to claims 3 and 4, Ward discloses that hydrocracking catalyst further comprises one or more hydrogenation components selected from nickel, cobalt, molybdenum, and tungsten, their oxides and sulfides (See column 8, lines 50-51, 57-61).

Art Unit: 1797

9. With respect to claim 5, Ward discloses that the catalyst composition further comprises porous inorganic refractory oxide for example alumina, silica-alumina, silica-magnesia, as well as combination of such materials (See column 6, lines 60-65).

10. With respect to claim 6, Ward discloses that the two zeolites (Y and beta) are in the form of physical mixture (See column 6, lines 56-65; Also see preparation of catalysts 1 through 8).

11. With respect to claim 7, Ward discloses using a hydrotreated vacuum gas oil feed (See column 14, lines 15-24).

Although Ward does not specifically disclose reducing nitrogen and sulfur, it is known to those skilled in the art that hydrotreating is conducted to reduce/remove nitrogen and sulfur compounds to avoid catalyst poisoning in the downstream operations.

Response to Arguments

12. Applicant's arguments filed 03/27/2008 have been fully considered but they are not persuasive.

13. The Applicant argues that Ward is silent about "contacting the feedstock with the catalyst in the presence of hydrogen at elevated temperature and pressure of 260-430°

C and 5-20MPa, to obtain a middle distillate with a content of aromatic compounds lower than the same fraction contained in the feedstock content." Ward teaches a process for hydrocracking a hydrocarbon feedstock with a catalyst comprising beta zeolite and 15-50% by weight of a Y zeolite for producing gasoline or middle distillate products, especially light gasoline and turbine fuel (col. 3, 11.24-34; see also ¶[0043] of the present application). Ward is silent, however, about low content aromatic compounds, or about "a middle distillate with a content of aromatic compounds lower than the same fraction contained in the feedstock content," or about using a specific catalyst to obtain such low aromatic content middle distillate.

The Applicant's argument is not persuasive because Ward is using a catalyst composition similar to the Applicant, similar feedstock, similar operating conditions, and producing middle distillates with reduced aromatics (See discussion under claim 1 above and column 3, lines 34-39; column 8, lines 26-39; column 11, lines 36-40; column 12, lines 37-42).

14. The Applicant argues that Ward also fails to disclose or suggest that "the beta zeolite has a silica-alumina ratio of at least about 250," as claim 1 recites. Ward teaches that the beta zeolite "is prepared, in general, as an aluminosilicate zeolite having a silica-to-alumina molar ratio... of at least 10 up to about 100, but preferably no more than about 40, and most preferably in the range of 20 to 30." (Col. 4, 11.3-7).

The Applicant's argument is not persuasive because Ward discloses beta zeolite having a silica-alumina ratio of at least 10 to 500 or more (See column 4, lines 3-8).

15. The Applicant argues that the process of Ward is not designed to maximize middle distillate yields (see col. 3, 11.33-39). Ward is also not concerned with producing middle distillates with low aromatic content and there is no specific disclosure on this topic. Additionally, Ward is not concerned with obtaining middle distillates with low pour points. Ward mentions that the disclosed catalyst includes zeolite beta having silica-to-alumina molar ratios as high as 500:1 or more. However, the most preferable disclosed range is a silica-to-alumina molar ratio of 20 to 30 (see col.4, 11.3-9). The examples of Ward also use a catalyst with a silica-to-alumina molar ratio of the low value of 26 lying within the preferred range.

The Applicant's argument is not persuasive because Ward is producing middle distillates (See column 3, lines 34-39; column 8, lines 26-39; column 11, lines 36-40; column 12, lines 37-42). Although Ward invention does not specifically disclose low aromatic content, the invention does disclose hydrogenation during hydrocracking operation (See column 7, lines 47-53). This will necessarily reduce aromatics in the middle distillates produced during hydrocracking. Although Ward prefers silica-to-alumina ratio in a lower range, the invention uses the ratio as high as 500:1.

16. The Applicant argues that the process of Ward has a different objective from the objective of the process of the claimed invention. Ward also provides a different catalyst from the one used in the claimed process since the silica-to-alumina molar ratios of the two catalysts are very different. Ward teaches the application of catalysts with low silica-to-alumina molar ratios, whereas the inventive process requires values of at least about 250. Thus, Ward does not provide any incentive to solve the problem of how to obtain middle distillates with reduced aromatic content using the disclosed catalyst. There is no mention of a synergistic effect on aromaticity obtainable with a mixture of the two catalysts.

The Applicant's argument is not persuasive because Ward uses similar catalyst, similar feedstock, similar operating conditions and produces similar products in the hydrocracking process as claimed by the Applicant. Thus, Ward process should inherently have the same synergistic effect on aromaticity as claimed by the Applicant because Ward also uses a mixture of two catalysts as claimed (See discussion under claim 1 above).

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PS 051408

/Glenn A Caldarola/
Acting SPE of Art Unit 1797